S18QUIZ: EXP LOG (SLTN v216)
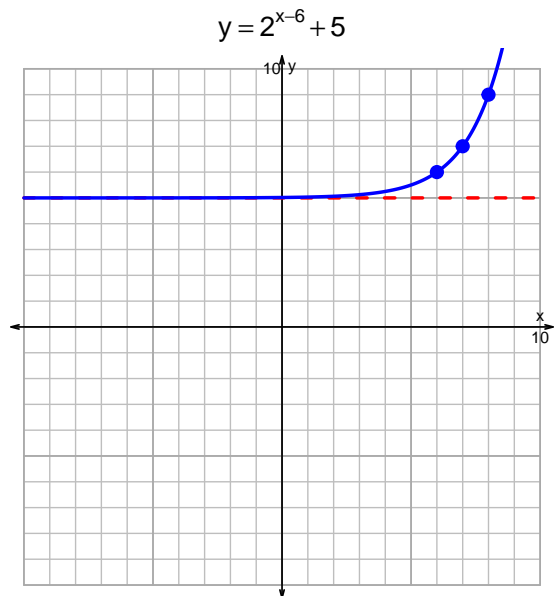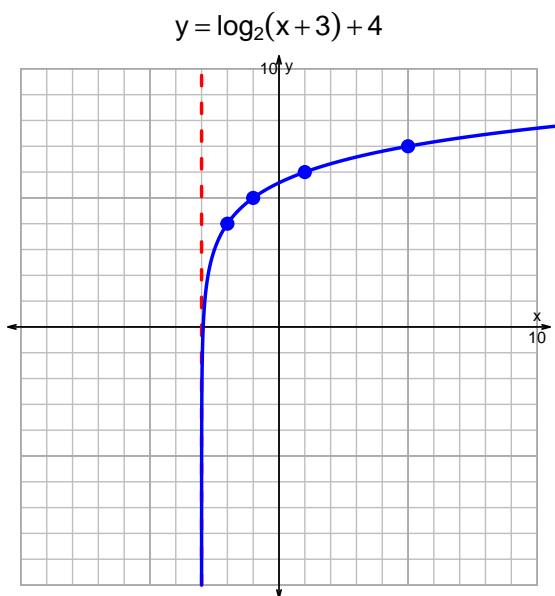
1. Graph $y = \log_2(x + 3) + 4$ and $y = 2^{x-6} + 5$ on the grids below. Also, draw any asymptotes with dotted lines.

$$y = \log_2(x + 3) + 4$$

$$y = 2^{x-6} + 5$$

2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$29 = \left(\frac{4}{3}\right) \cdot 2^{-5t/7}$$

Divide both sides by $\frac{4}{3}$.

$$\frac{29 \cdot 3}{4} = 2^{-5t/7}$$

Take log, base 2, of both sides.

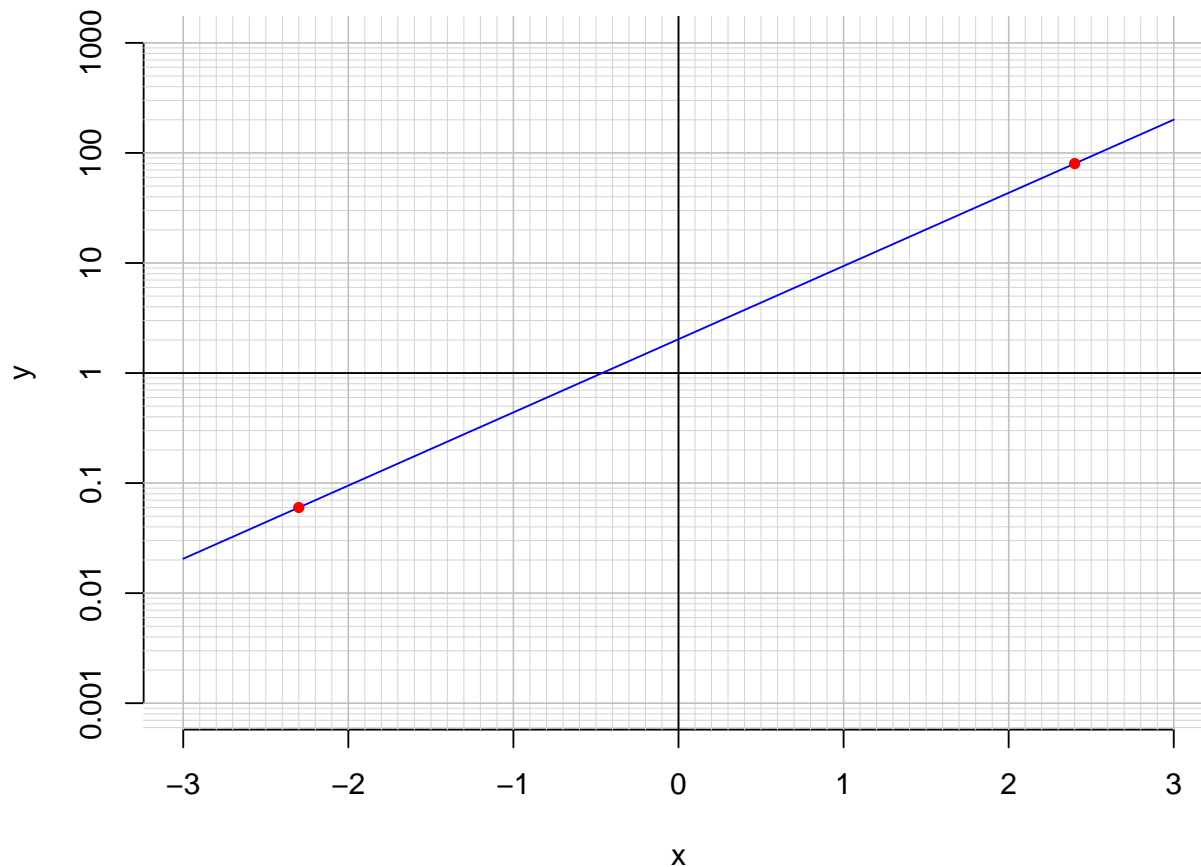$$\log_2\left(\frac{29 \cdot 3}{4}\right) = \frac{-5t}{7}$$

Divide both sides by $\frac{-5}{7}$.

$$\frac{-7}{5} \cdot \log_2\left(\frac{29 \cdot 3}{4}\right) = t$$

Switch sides.

$$t = \frac{-7}{5} \cdot \log_2\left(\frac{29 \cdot 3}{4}\right)$$

3. An exponential function $f(x) = 2.03 \cdot e^{1.53x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(-2.3)$.

$$f(-2.3) = 0.06$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{1}{1.53} \cdot \ln\left(\frac{x}{2.03}\right)$$

c. Using the plot above, evaluate $f^{-1}(80)$.

$$f^{-1}(80) = 2.4$$